



Axial Piston Pumps

Series PVplus
Variable Displacement



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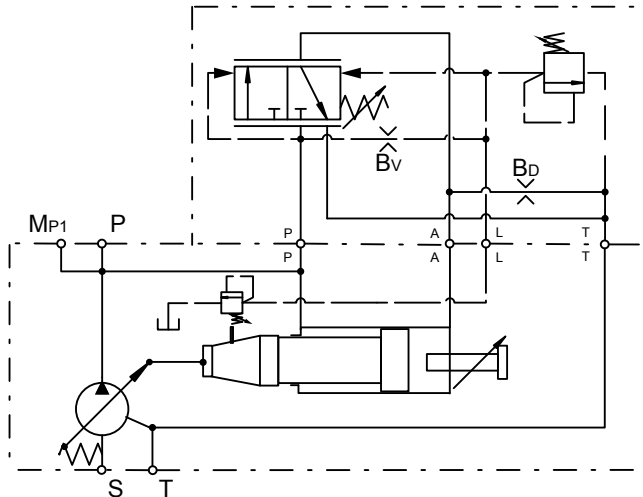
ENGINEERING YOUR SUCCESS.

Horse Power/Torque Controls with Pressure Control

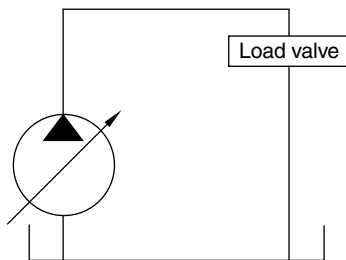
Control option *LC

The horse power control type *L* provides the benefit of the pressure control, plus the ability to limit the input power the pump will draw. These controls are beneficial when the power available from the prime mover for the hydraulics is limited or the application power demand has both high flow/low pressure and low flow/high pressure duty cycles.

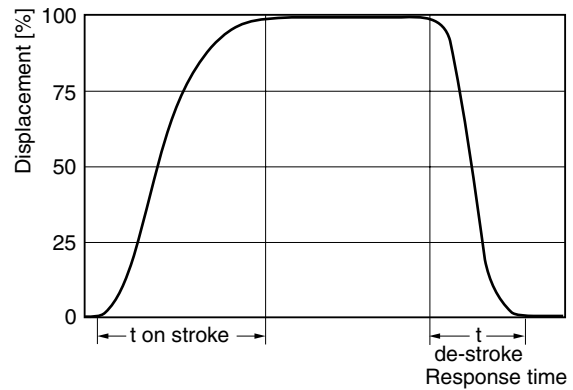
Control schematics



Response times of the pump are collected from a circuit as below by measuring the pumps swash angle movement at different pressures.



Dynamic characteristic of flow control *



* Curve shown exaggerated

	Time on-stroke [ms]		Time de-stroke [ms]	
	against 50 bar	against 350 bar	zero stroke 50 bar	zero stroke 350 bar
PV360	90	90	100	100

Pressure adjustment range	15 to 350 bar
Factory setting pressure	350 bar
Differential pressure adjustment range	10 to 40 bar
Factory setting differential pressure	15 bar
Control oil consumption	Max 8.0 l/min
Typically pilot flow	approx 1,5 l/min

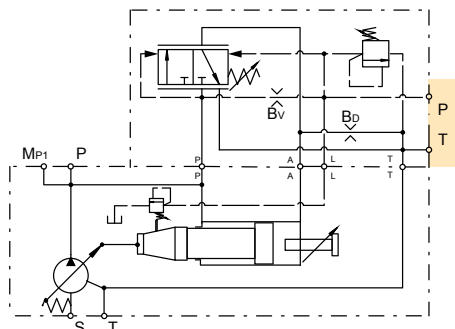
See Horse Power characteristic curves on page 30

Horse Power/Torque Control with NG6 Interface

Control option *L1

With code *L1 the horse power control has a valve interface size NG 6 DIN 24340 (CETOP 03 acc. RP35H, NFPA D03) on the top side.

This interface allows the mounting of accessories like multiple pressure selectors without the need of external piping and valve mounting.

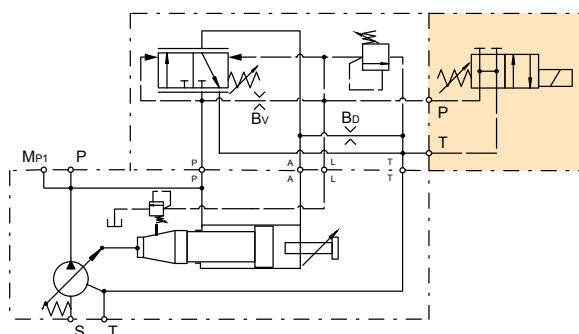


Horse Power/Torque Control with Electrical Unloading

Control option *LW

With code *LW a solenoid operated directional control valve (D1VW002KNJW) for electrical unloading is mounted on the control top side.

When the solenoid is de-energised, the pump compensates at a stand-by pressure of typically 15 bar. When the solenoid is energised, the pump compensates at the pressure adjusted on the integrated pilot valve.

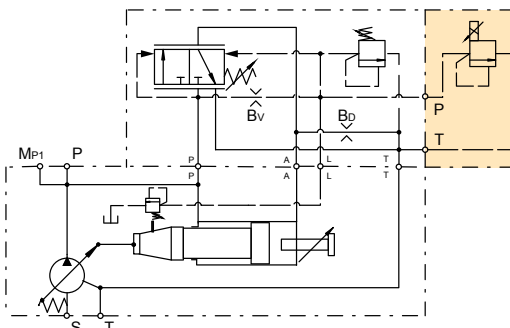


Horse Power/Torque Control with Proportional Pilot Valve

Control option *LK

With code *LK a proportional pilot valve of type PVACRE...K35 (see page 43) is mounted on the top side interface.

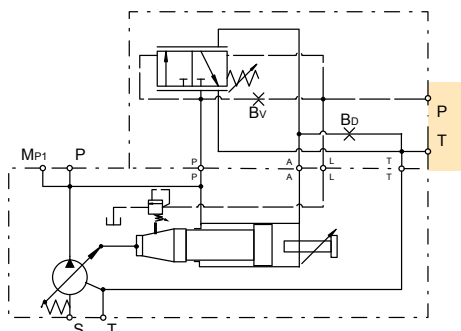
This allows a variation of the pump compensating pressure between 20 and 350 bar by an electrical signal.



Horse Power/Torque Control without Integrated Pressure Pilot Valve

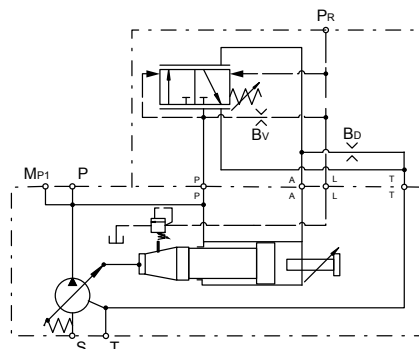
Control option *LZ

Control *LZ has no integrated pilot valve but a NG6 DIN 24340 interface topside.



Control option *LB

Control *LB has no integrated pilot valve.



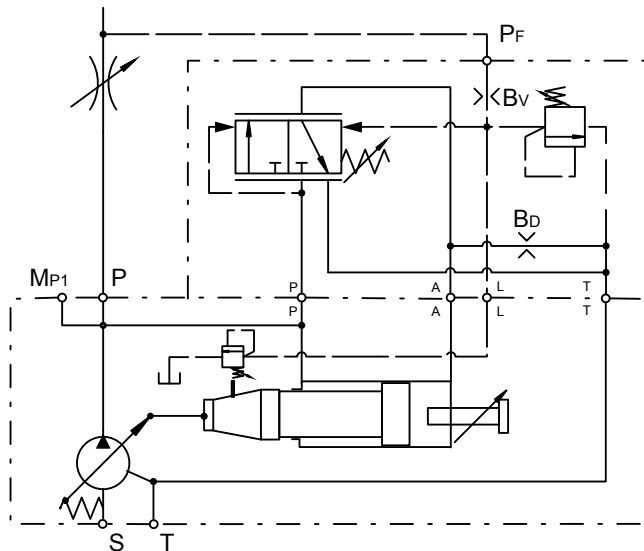
This version is recommended for valve accessories.

Horse Power/Torque Controls with Load Sensing

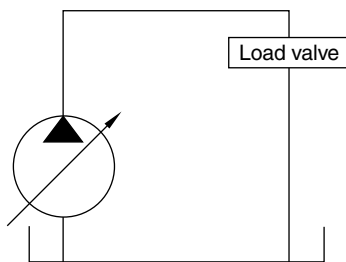
Control option *CC

The horse power control type *C* provides the benefit of the load sensing control, plus the ability to limit the input power the pump will draw. These controls are beneficial when the power available from the prime mover for the hydraulics is limited or the application power demand has both high flow/low pressure and low flow/high pressure duty cycles.

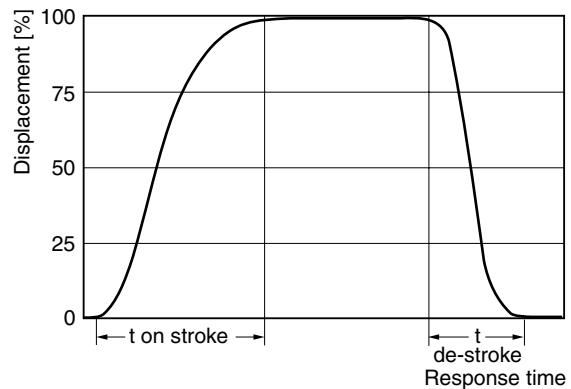
Control schematics



Response times of the pump are collected from a circuit as below by measuring the pumps swash angle movement at different pressures.



Dynamic characteristic of flow control *



* Curve shown exaggerated

	Time on-stroke [ms]		Time de-stroke [ms]	
	stand-by to 50 bar	stand-by to 350 bar	50 bar to stand-by	350 bar to stand-by
PV360	90	90	100	100

Pressure adjustment range	15 to 350 bar
Factory setting pressure	350 bar
Differential pressure adjustment range	10 to 40 bar
Factory setting differential pressure	15 bar
Control oil consumption	Max 8.0 l/min
Typically pilot flow	approx 1,5 l/min

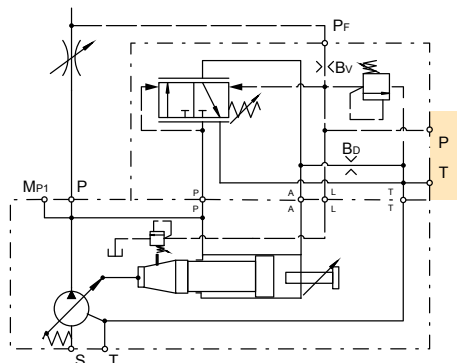
See Horse Power characteristic curves on page 30

Horse Power/Torque Control with Load Sensing & NG6 Interface

Control option *C1

With code *C1 the horse power control has a valve interface size NG 6 DIN 24340 (CETOP 03 acc. RP35H, NFPA D03) on the top side.

This interface allows the mounting of accessories like multiple pressure selectors without the need of external piping and valve mounting.

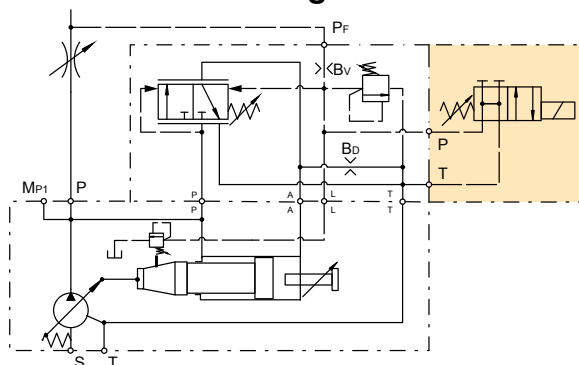


Horse Power/Torque Control with Load Sensing & Electrical Unloading

Control option *CW

With code *CW a solenoid operated directional control valve (D1VW002KNJW) for electrical unloading is mounted on the control top side.

When the solenoid is de-energised, the pump compensates at a stand-by pressure of typically 15 bar. When the solenoid is energised, the pump compensates at the pressure adjusted on the integrated pilot valve.

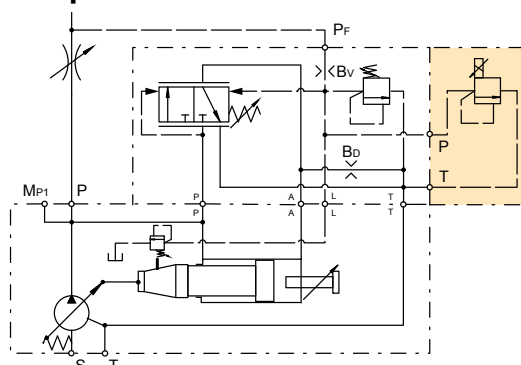


Horse Power/Torque Control with Load Sensing & Proportional Valve

Control option *CK

With code *CK a proportional pilot valve of type PVACRE...K35 (see page 43) is mounted on the top side interface.

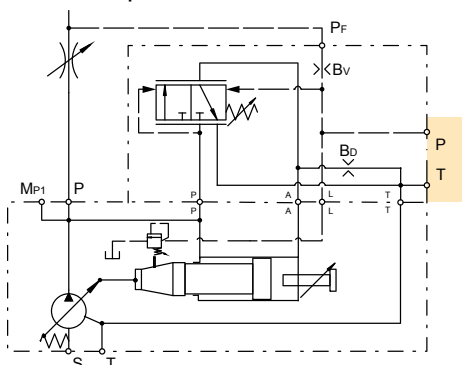
This allows a variation of the pump compensating pressure between 20 and 350 bar by an electrical signal.



Horse Power/Torque Control with Load Sensing without Integrated Pilot Valve

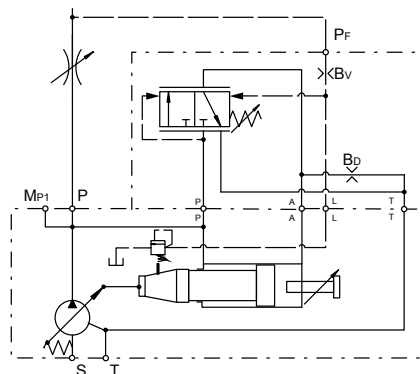
Control option *CZ

Control *CZ has no integrated pilot valve but NG6 DIN 24340 interface topside.

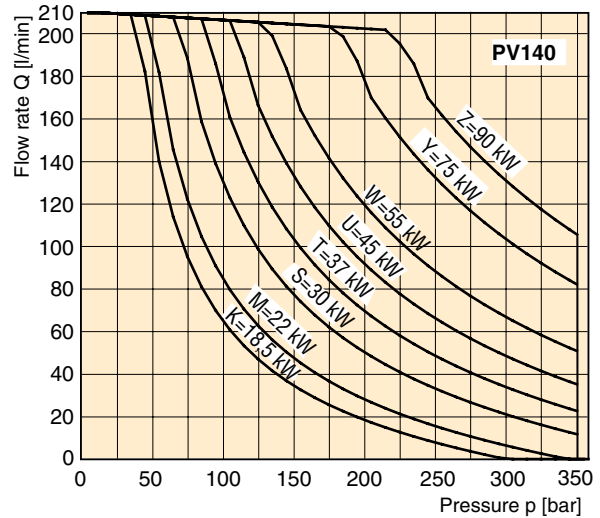
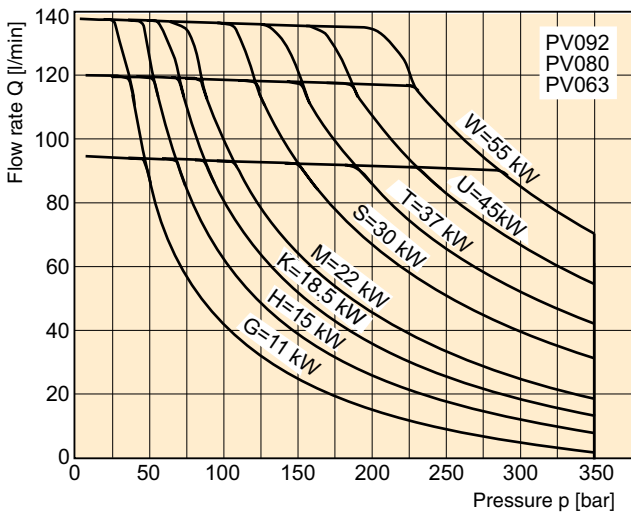
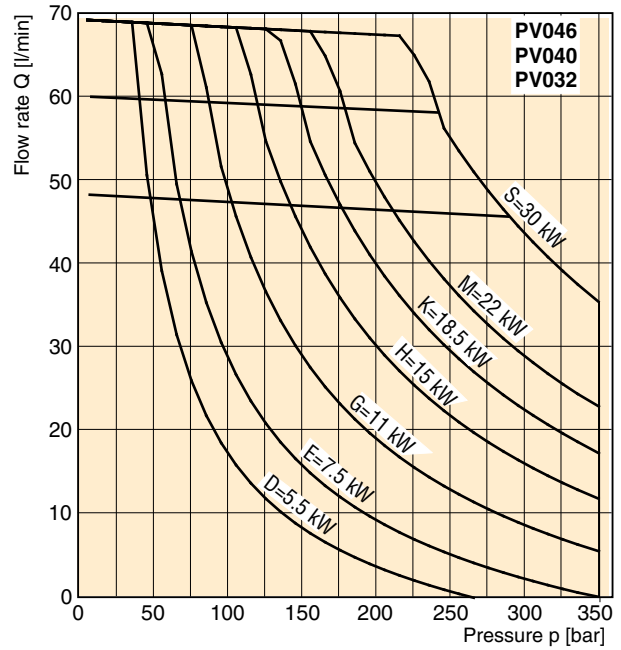
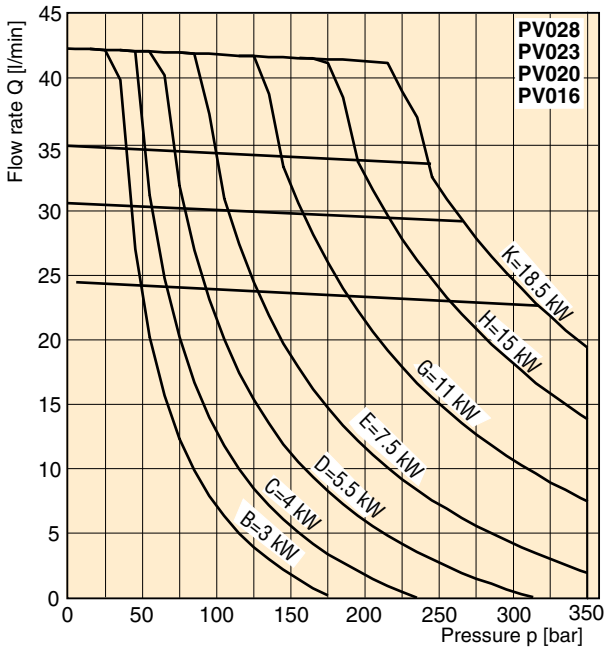


Control option *CB

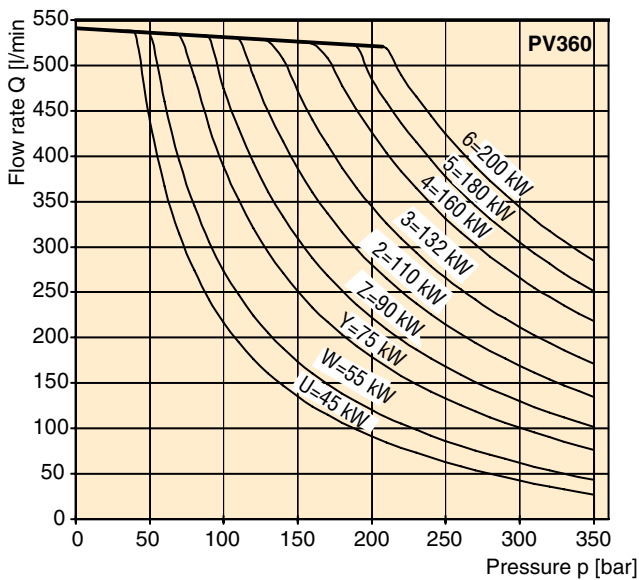
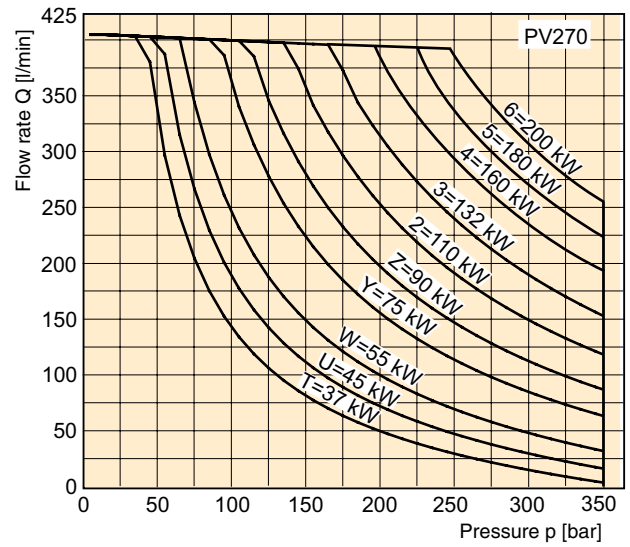
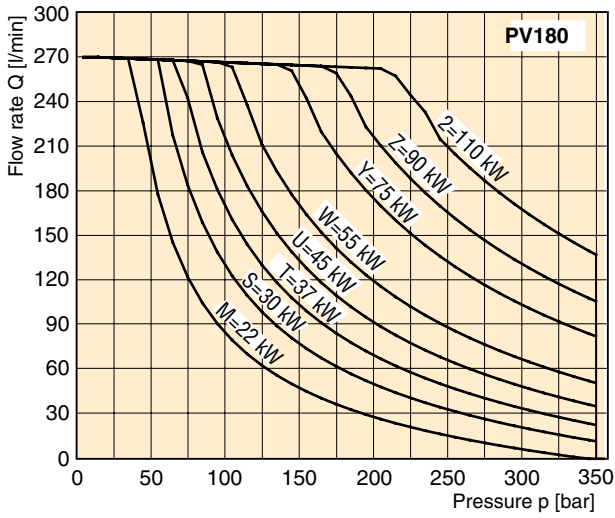
Control *CB has no integrated pilot valve.



Typical Horse Power/Torque Control Characteristics

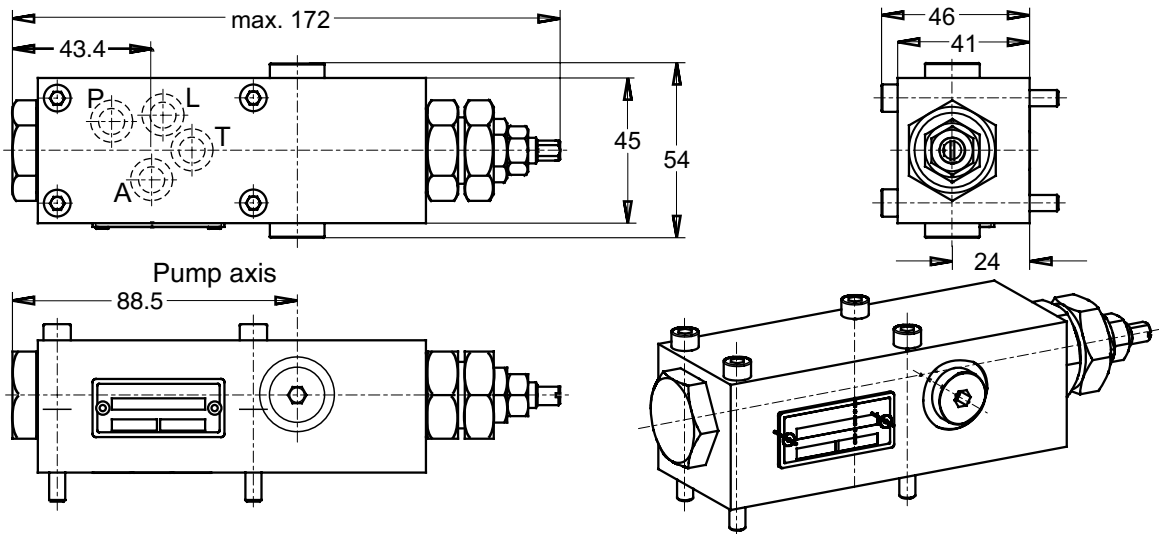


Typical Horse Power/Torque Control Characteristics



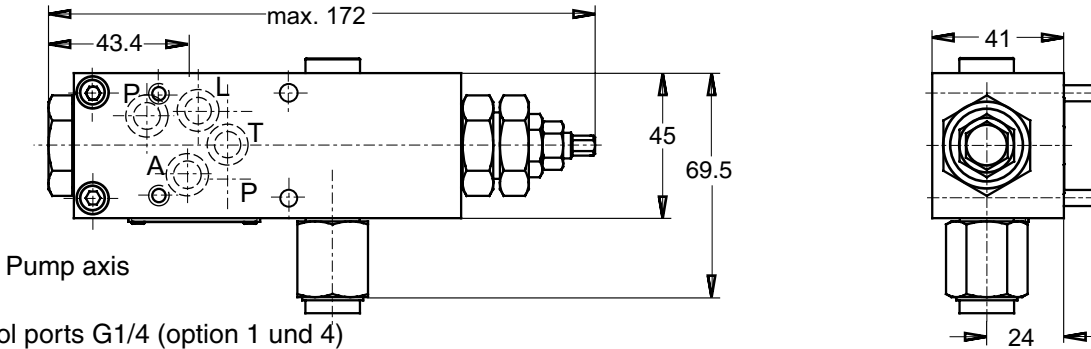
Speed : n = 1500 rev/min
 Temperature : t = 50 °C
 Fluid : HLP, ISO VG46
 Viscosity : $\nu = 46 \text{ mm}^2/\text{s}$ at 40 °C
 Pressure : Maximum 350 bar, depending on HP level

Dimensions standard pressure control, code ...MMC

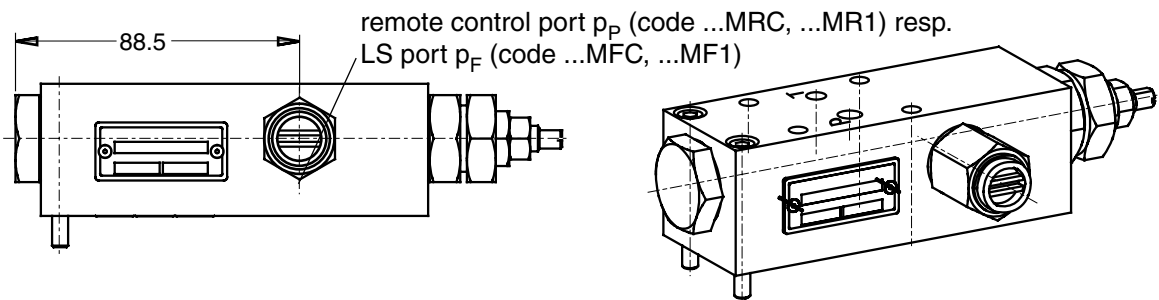


Controls with code ...MM1 have a NG6 / Cetop 3 interface topside (as shown below)

Dimensions remote pressure and load sensing control, codes ...MR1, ...MF1

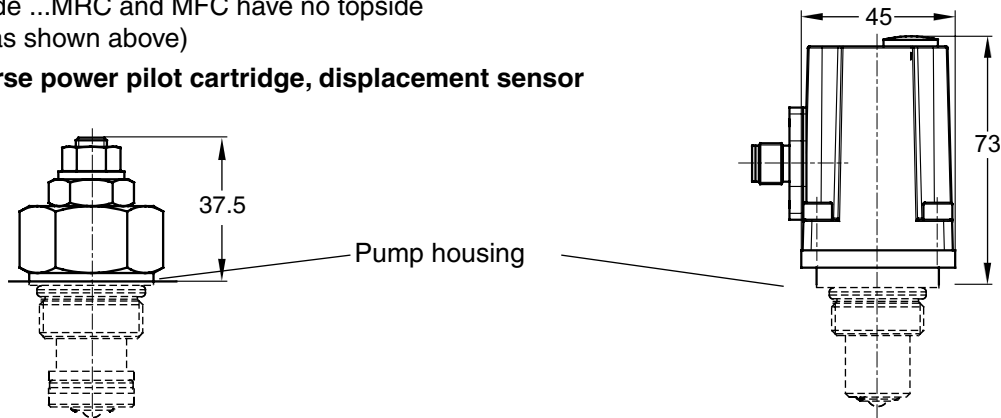


control ports G1/4 (option 1 und 4)
 optional 7/16-20 UNF (option 3)
 optional M12x1,5 (option 8)

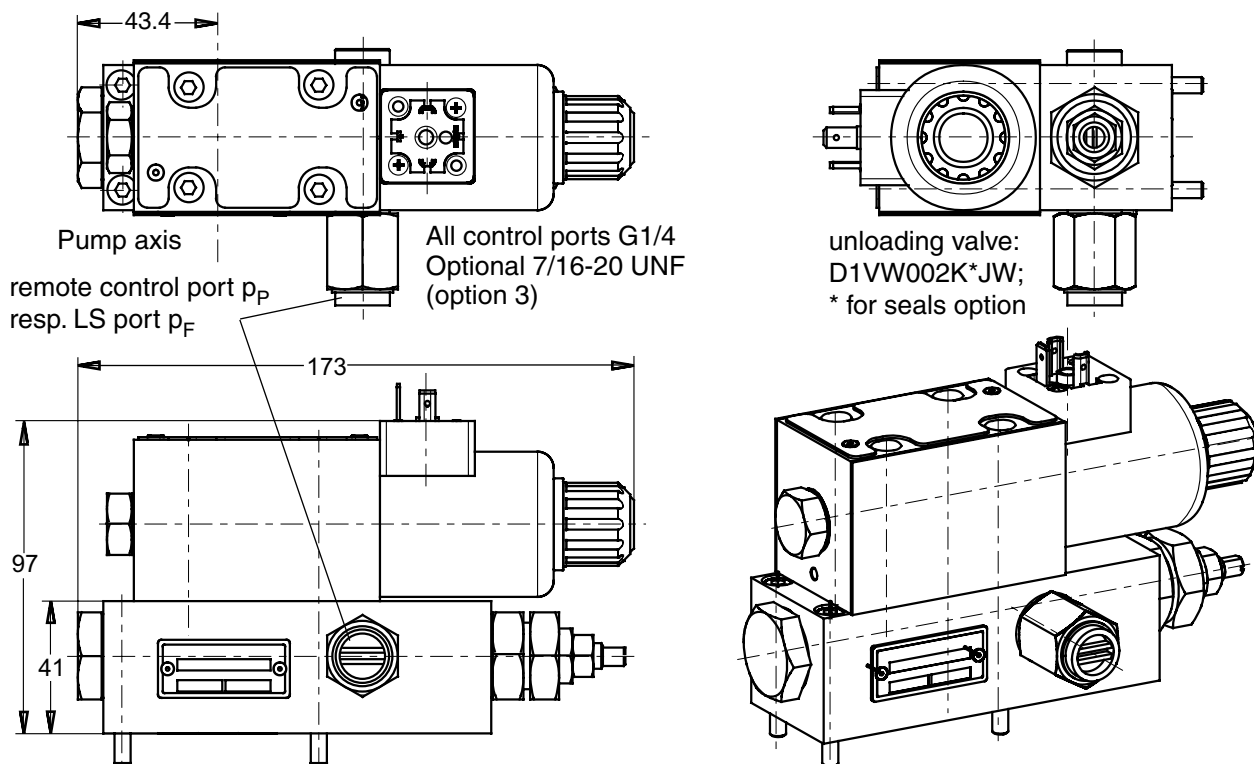


Controls with code ...MRC and MFC have no topside valve interface (as shown above)

Dimensions horse power pilot cartridge, displacement sensor

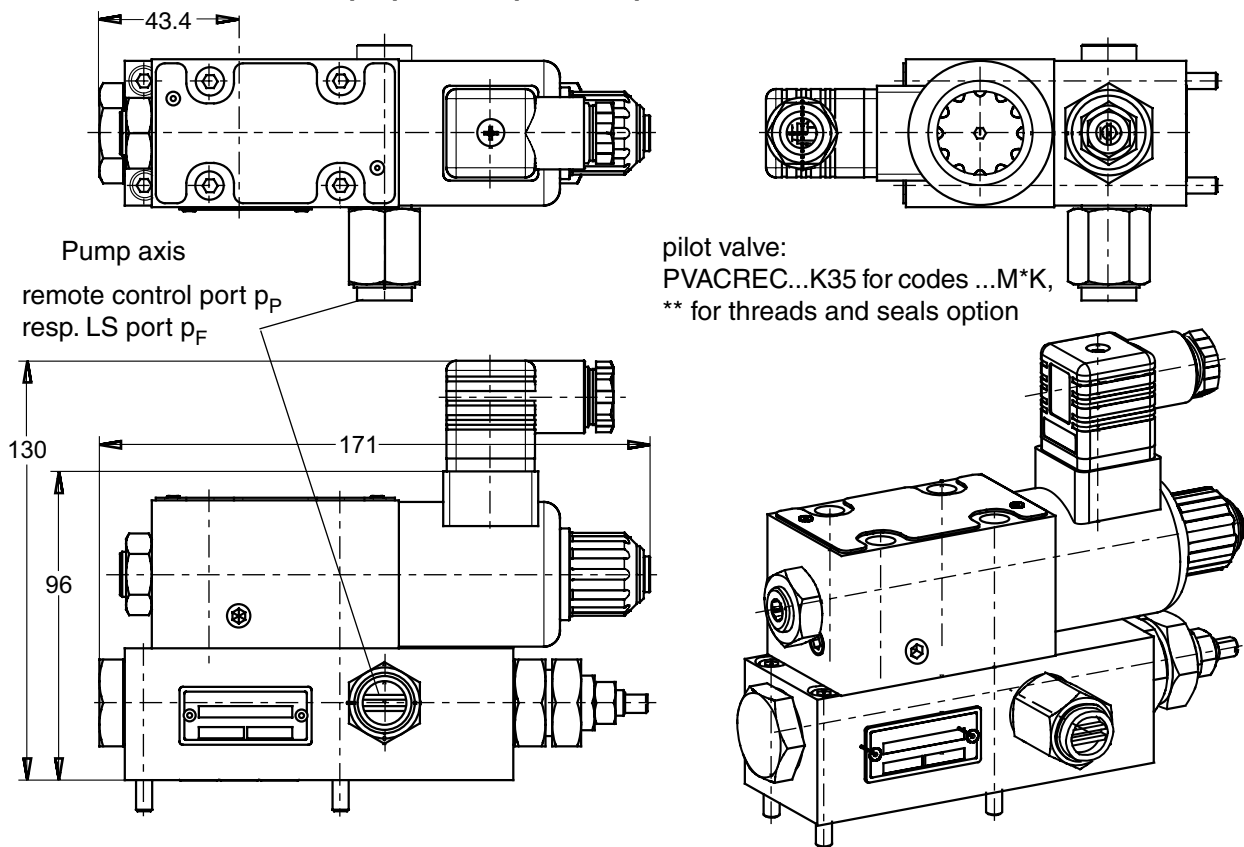


Dimensions for controls with unloading valve, codes ...M*W



Shown in version MRW/MFW, version MMW has no remote control port.

Dimensions for controls with proportional pressure pilot valve, codes ...M*K



Shown in version MRK/MFK, version MMK has no remote control port.

Dimensions for horse power compensator *L* and *C* are identical to MM* respectively MF*.

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